

## Our Carnival Adventure

### Brief Overview:

Students will collect and organize data in order to create bar graphs. With the information they recorded, they will create an advertisement for the local carnival. After creating their advertisement, they will write a letter to the carnival owner persuading him to use their advertisement.

### NCTM 2000 Principles for School Mathematics:

- . **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*
- . **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*
- . **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*
- . **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*
- . **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*
- . **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

### Links to NCTM 2000 Standards:

- . **Content Standards**

#### **Data Analysis and Probability**

- . *Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them; collect data using observations, surveys, and experiments; and represents data using tables and graphs such as: line plots, bar graphs, and line graphs.*
- . *Select and use appropriate statistical methods to analyze data; describe the shape and important features of a set of data and compare related data sets, with an emphasis on how data are distributed; use measure of center, focusing on the median and understand what each does and does not indicate about the data set; and compare different representations of the same data and evaluate how well each representation shows important aspects of the data.*
- . *Develop and evaluate inferences and predictions that are based on data; and propose and*

*justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.*

*Understand and apply basic concepts of probability; describe events as likely or unlikely and discuss that degree of likelihood using such words as certain, equally likely and impossible; predict the probability of outcomes of simple experiments and test the predictions; and understand that the measure of the likelihood of an event can be represented by a number from 0 to 1.*

## **Process Standards**

### **Problem Solving**

*Instructional programs from pre-kindergarten through grade 12 should enable all students to build new mathematical knowledge through problem solving; solve problems that arise in mathematics and in other contexts; apply and adapt a variety of appropriate strategies to solve problems; and monitor and reflect on the process of mathematical problem solving.*

### **Reasoning and Proof**

*Instructional programs from pre-kindergarten through grade 12 should enable all students to recognize reasoning and proof as fundamental aspects of mathematics; make and investigate mathematical conjectures; develop and evaluate mathematical arguments and proofs; and select and use various types of reasoning and methods of proof.*

### **Communication**

*Instructional programs from pre-kindergarten through grade 12 should enable all students to organize and consolidate their mathematical thinking through communication; communicate their mathematical thinking coherently and clearly to peers, teachers, and others; analyze and evaluate the mathematical thinking and strategies of others; and the language of mathematics to express mathematical ideas precisely.*

### **Connections**

*Instructional programs from pre-kindergarten through grade 12 should enable all students to recognize and use connections among mathematical ideas; understand how mathematical ideas interconnect and build on one another to produce a coherent whole; and recognize and apply mathematics in context outside of mathematics.*

### **Representation**

*Instructional programs from pre-kindergarten through grade 12 should enable all students to create and use representations to organize, record, and communicate mathematical ideas; select, apply, and translate among mathematical representations to solve problems; and use representations to model and interpret physical, social, and mathematical phenomena.*

## **Grade/Level:**

Grades 1-3

**Duration/Length:**

Five- six hours depending on level of students

**Prerequisite Knowledge:**

Students should have working knowledge of the following skills:

- . Creating a frequency table
- . Writing a persuasive letter
- . Completing “round table” activities

**Student Outcomes:**

Students will:

- . collect and organize data.
- . Learn the five parts to a bar graph (x-axis, y-axis, title, labels and scale).
- . Understand the importance of creating an appropriate scale.
- . interpret and analyze data recorded on a bar graph.

**Materials/Resources/Printed Materials:**

- . Book about carnivals- Suggestion: Clifford and the Spring Carnival by Cheyette Lewison
- . Round Table Activity Sheet for each group
- . Student packet of resource sheets
- . Materials for carnival games (optional)
- . White construction paper 10” x 18”
- . Markers

**Development/Procedures:****Activity 1**

1. As a motivation for the lesson, read a carnival book to the class.
2. Distribute “round table” work sheet to each group. Explain to the students they will complete the “round table” work sheet by brainstorming a list of words that are associated with a carnival (Student Resource Sheet # 1.) Share brainstorming with class.
3. Share with class that Mr. Likerides is bringing his carnival to our neighborhood. He needs to have someone design an advertisement that will make people want to come to his carnival. As a class, review with your students the purpose of advertisements and show some examples from newspapers, magazines, or flyers to determine the information that should appear on an advertisement. Ask the class, what should be on our advertisement? (*Student responses should include: date, time, and*

*attractions.*) Tell the students that we cannot put all of the things they brainstormed on the advertisement so they must decide what information is important. Ask students, how they should decide? (*Student response: “Put the most popular things on the advertisement”.*) Then ask students, how they can determine the most popular attractions at a carnival? (*Student response: “Take a vote”.*) After the class agrees to take a vote, ask them how they should collect the data and organize it? (*Student response: “Ask students in our class their favorite things and organize the data on a table”.*)

## Activity 2

1. Review with the class the “round table” worksheet from Activity 1. Have students brainstorm a list of foods you could find at a carnival. They can use information on their worksheets or new ideas. As the students brainstorm write the list of foods on the board.
2. Remind the students about the purpose of gathering the data (*to create the advertisement*) and how they decided to do it (*voting and recording on a frequency table*).
3. Have groups discuss ways to make a frequency table with the types of carnival food on it. Have each student turn to the first page in their packet and complete as a class.
4. Poll the class to see what their favorite carnival food is. While polling have students record the data on their frequency table (Student Resource Sheet # 2). Discuss results and make sure all students have the correct information.
5. Explain to the students that there are many ways to display data other than using a frequency table. Tell them that today they will learn to display data in a bar graph. Show them a sample of a bar graph. Tell them that there are certain parts that every bar graph needs. Have them think-pair-share about what a bar graph needs. Write down the correct responses on the board. *The parts of a bar graph are x-axis, y-axis, title, labels, and scale.* Using the overhead show the student each part while naming them.
6. Have students use Student Resource Sheet # 3 to create a bar graph as a class using the information collected earlier. Discuss the results. After this activity assess students by distributing Teacher Resource Sheet #1.

## Activity 3

1. Review with the students the purpose for gathering the carnival data. Discuss the findings from yesterday and how that might affect their advertisement.
2. Brainstorm a list of rides found at a carnival (limit list to about 5 rides). Write the list on the board.
3. Have students create a frequency table listing their favorite rides.
4. Talk about how the class should take the poll concerning favorite carnival rides today. (*Students responses: “Poll the class” or “the school”.*)
5. Tell students they are going to poll the entire school including the adults.
6. Assign students to different classrooms or areas of the school. The student will be responsible for polling their area and collecting the data on their frequency

table.

7. Have students turn to Student Resource Sheet # 4 in their packet. On this page the class will combine the data they collected from the entire school. Teacher will facilitate this process by completing the table with them on an overhead.
8. Tell the students they will be using their frequency tables to create a bar graph. Explain that there were more people polled today than yesterday, so we are going to have a larger graph. On the overhead demonstrate how difficult it would be to graph the data with the same scale used previously. Ask the students to think of ways to solve this problem with scaling. (*Student responses: "Change the scale".*) Explain to students that they can change the scale, but it needs to be increased by the same amount. One way they can make sure of this is to skip count by a number. Model how to graph numbers that fall in between the numbers written on the scale.
9. As a class decide a scale to use. In groups have students create the bar graph on Student Resource Sheet # 5.
10. To assess student understanding of the concept of scale, have them respond to the following prompt: Explain how you create a scale for a bar graph.

*Sample Response: When I am making the scale on a bar graph, I look to see how many people voted. Then, I decide whether I should count by ones, twos, or fives. For example, if 20 people voted, I would skip count by twos.*

#### **Activity 4**

1. Set up carnival games around the classroom. Some examples of carnival games you can use in your classroom include: bean bag toss, ring toss, and ping-pong toss. *Note: Teacher should set up games that are feasible for their class. There should be approximately six games to play.*
2. Have students play each game.
3. Poll the class on their favorite carnival game. Record data on Student Resource Sheet # 6.
4. Have students display their data on a bar graph on Student Resource Sheet # 7. This step should be independently done, so teacher can assess student understanding.

#### **Activity 5**

1. Review with the students the information they collected and their purpose for collecting data. Discuss the results and how the results influence our advertisements. Remind them that space on the advertisement is limited, so they will not be able to have everything on it.
2. Have students independently complete step one of the vignette on Teacher Resource Sheet # 2.

*Step One: Now that we know the favorite carnival foods, rides, and games.*

*Create a poster that will advertise the upcoming carnival. Be sure to use the data we collected when designing your poster.*

After step one, have students complete step two of the vignette.

*Step Two: Write a letter to the carnival owner, Mr. Likerides, persuading him to use your advertisement. Be sure to include information from your bar graphs.*

### **Performance Assessment:**

The carnival advertisement and letter to the carnival owner is designed to be the final assessment for this unit. A scoring tool has been provided for you on Teacher Resource Sheet # 3. Throughout the unit there are other opportunities for assessment.

### **Extension/Follow Up:**

You may want to extend this unit by using the data collected to create different types of graphs, such as line plots or stem and leaf plots.

### **Authors:**

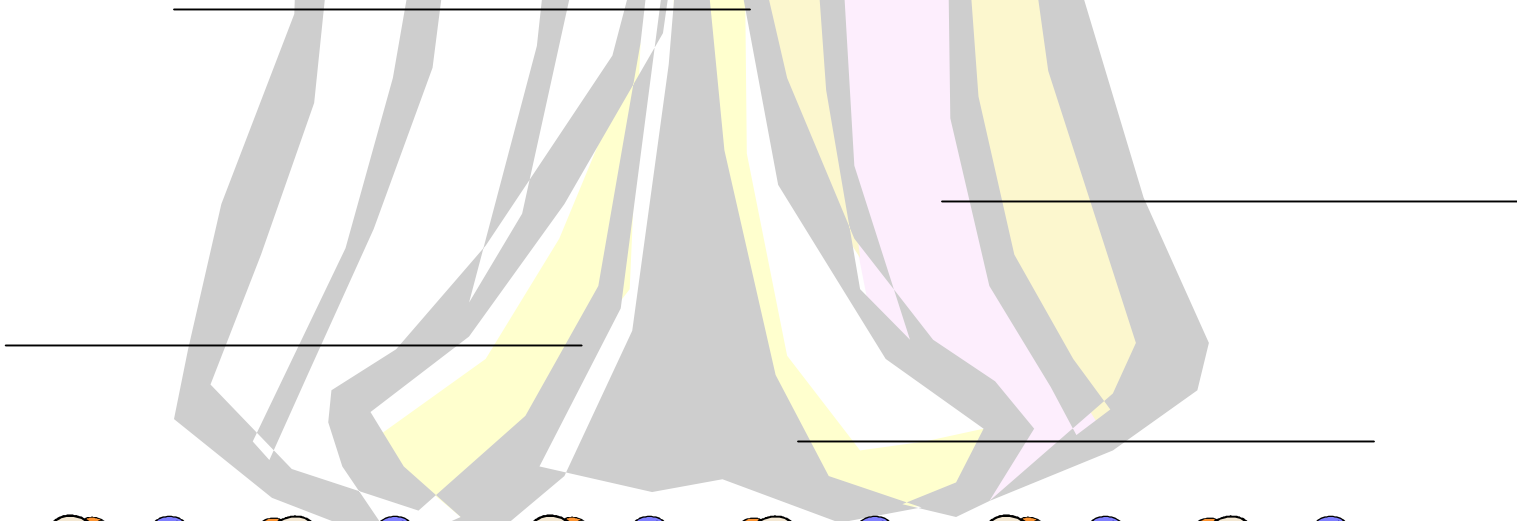
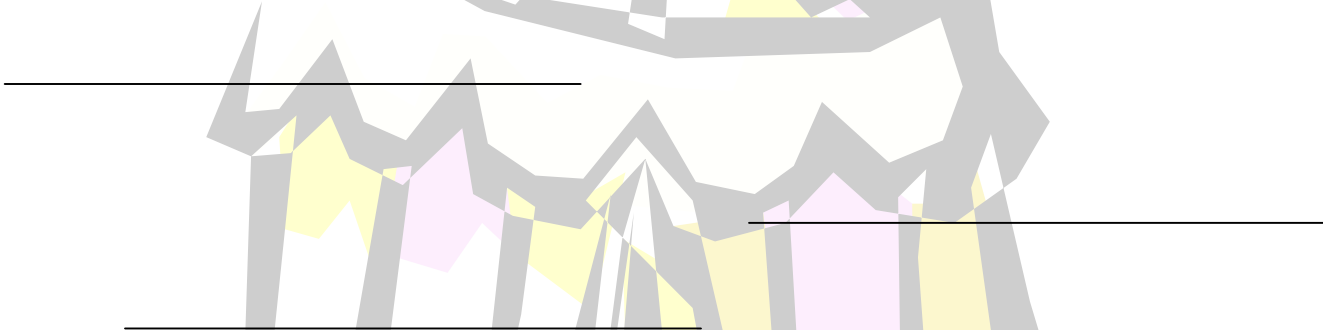
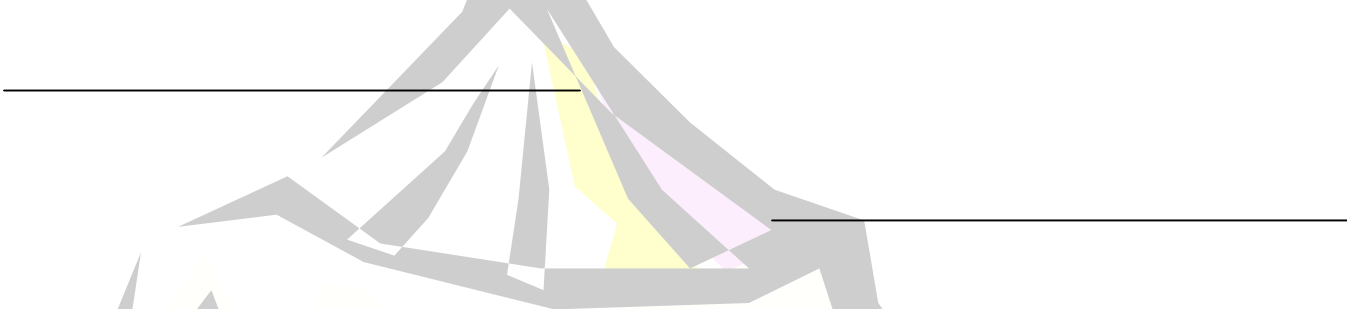
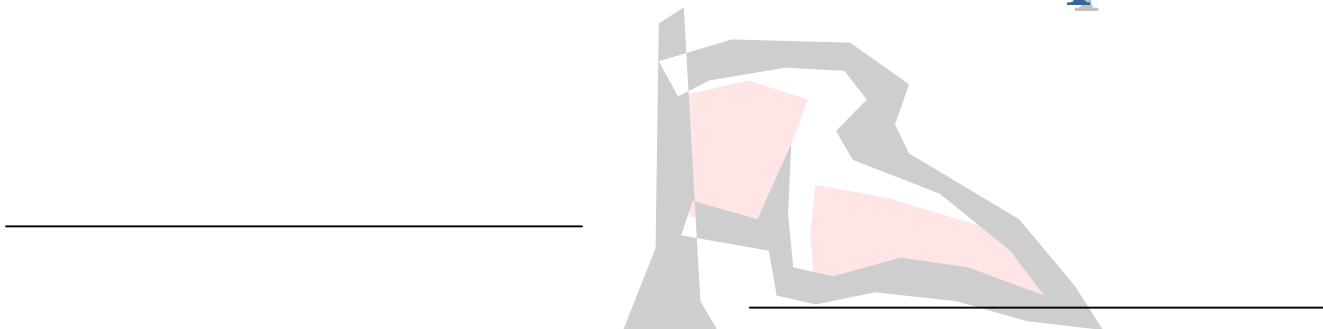
Katherine M. Buckmaster  
Baltimore Highlands Elementary  
Baltimore County, Maryland

Amanda K. Johnson  
Baltimore Highlands Elementary  
Baltimore County, Maryland





# Carnival Round-Up





Student Re

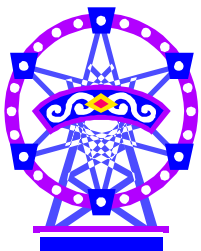
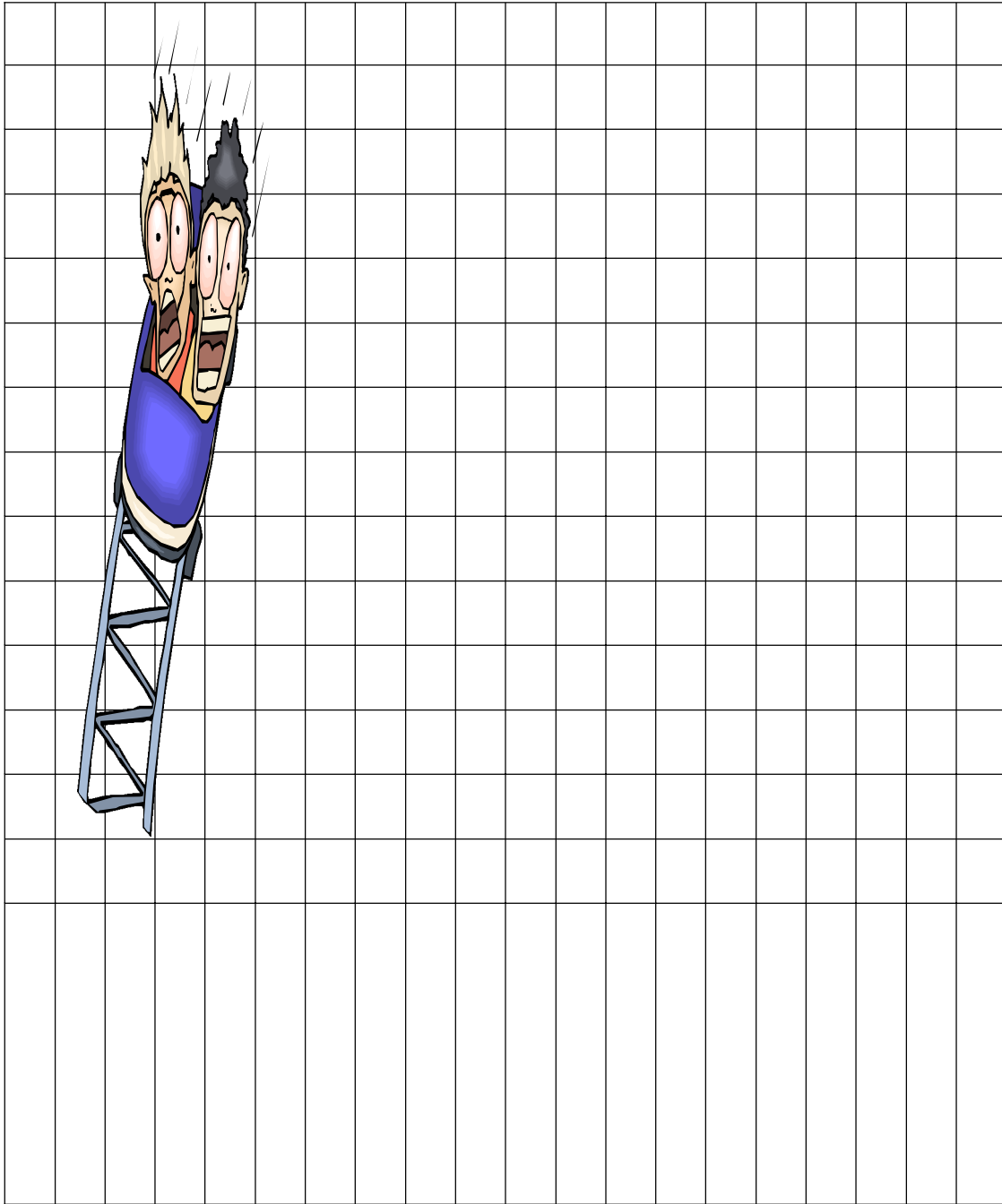



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# Our Carnival Adventure





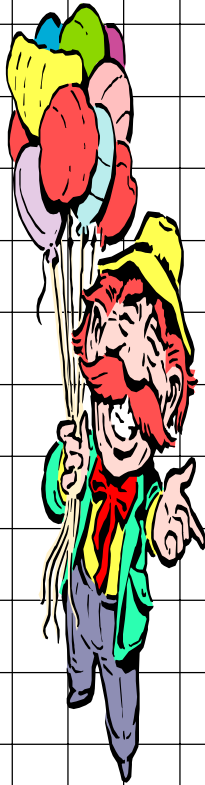
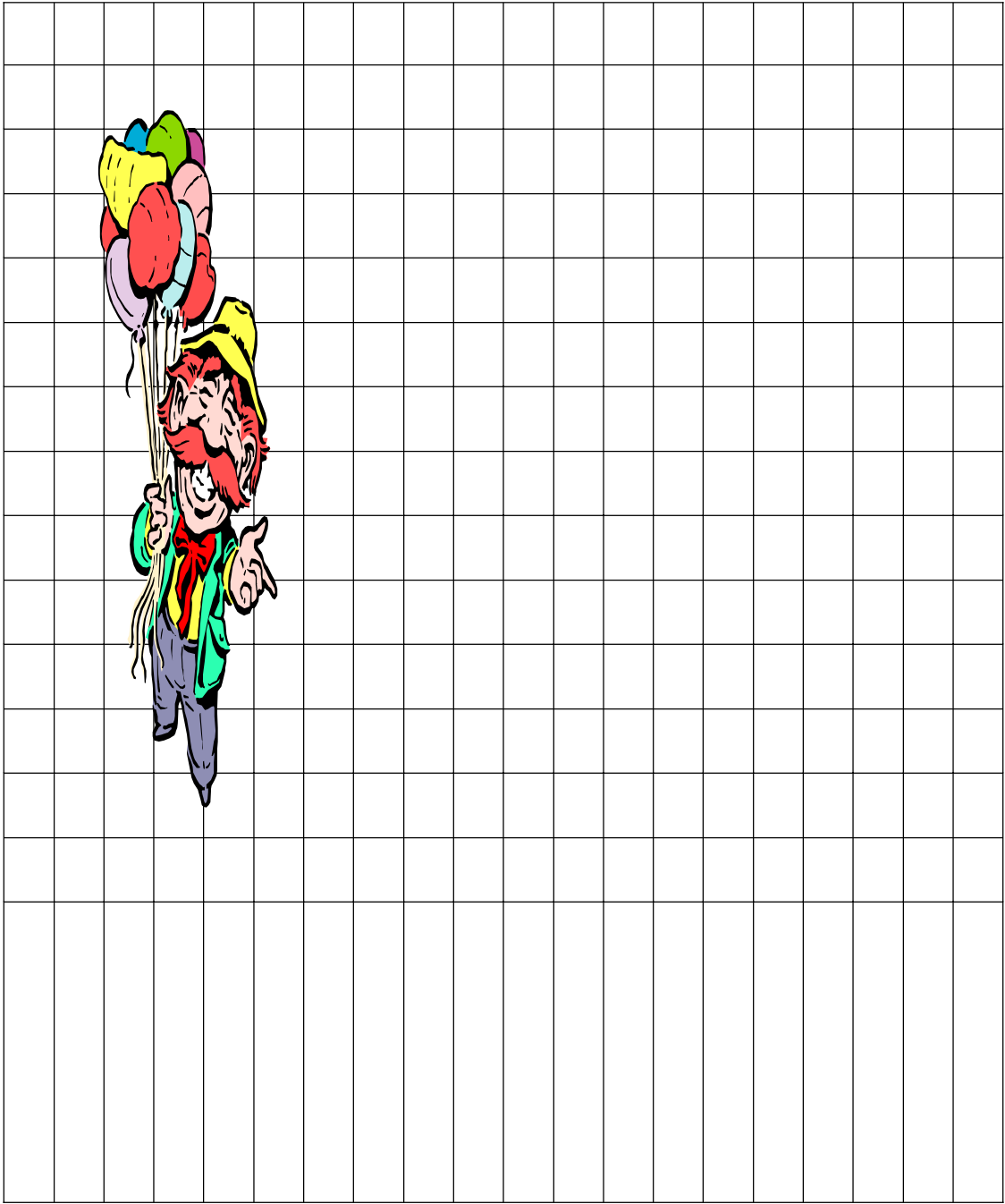
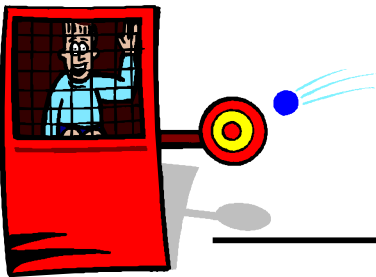



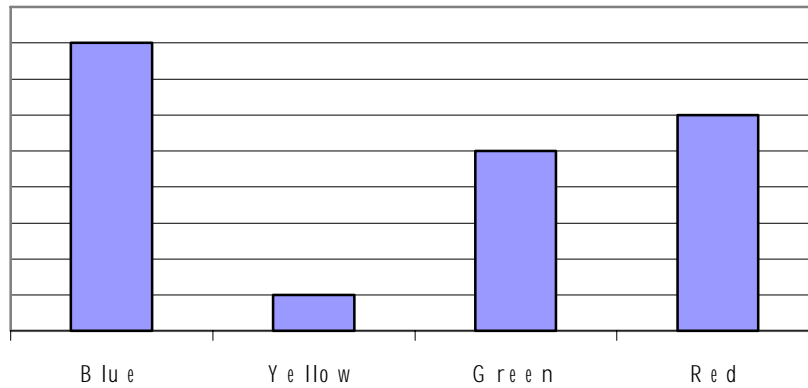
# Our Carnival Adventure



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Ms. Giggles and I tried to display data we collected on this bar graph. We think we might have forgot to label some of the parts. Please help us figure out what we remembered to label and what we forgot.

# Remembered




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# Forgot




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Name \_\_\_\_\_

## Our Carnival Adventure

*Step One: Now that we know the favorite carnival foods, rides, and games, create a poster that will advertise the upcoming carnival. Be sure to use the data we collected when designing your poster.*

*Step Two: Write a letter to the carnival owner, Mr. Likerides, persuading him to use your advertisement. Be sure to include information from your bar graphs.*



## Writing to Persuade Scoring Rubric

The student:

**3**

- ✓ includes three reasons for using their poster.
- ✓ includes three pieces of data from the bar graphs.
- ✓ includes all parts of a friendly letter.
- ✓ always uses complete sentences.
- ✓ has no errors in punctuation, capitalization, and spelling.

**2**

- ✓ includes two reasons for using their poster.
- ✓ includes two pieces of data from the bar graph.
- ✓ includes only four parts of a business letter.
- ✓ sometimes uses complete sentences.
- ✓ has very few errors in punctuation, capitalization, and spelling.

**1**

- ✓ includes only one reason for using their poster.
- ✓ includes only one piece of data from bar graph.
- ✓ includes only three pieces of a business letter.
- ✓ rarely uses complete sentences.
- ✓ has many errors in punctuation, capitalization, and spelling.

**0**

- ✓ has little or no response